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FINAL EXAM

TRIMESTER 3, 2021/2022

BUE3014 – URBAN ECONOMICS
(All sections / Groups)

8 AUGUST 2022
9:00a.m. – 11:00a.m.
(2 Hours)

INSTRUCTIONS TO STUDENTS

1. This question paper consists of **FOUR (4)** printed pages (including the cover page) with **FOUR (4)** structured questions.

2. Marks are shown at the end of each question.

3. Write all your answers in the answer booklet provided.

4. Answer all questions.

QUESTION ONE (25 MARKS)

(a)   Explain decision-making based on the marginal principle, for a firm's decision on the height of a new multi-storey building.

(9 marks)

(b)   A citizen of Cybertown donated a 10-hectre orchard to the city. The city has decided to convert the orchard to a public recreational park, using 1,000 hours of volunteer time. The machinery and equipment that has a current market value of RM36,000 have been donated, and will also be used in this project. The project will be completed in one month. You are the project manager of the public recreational park project.

(i)   Based on the scenario above, give **THREE (3)** additional information that you will need as the project manager to compute the cost of the park, using the opportunity cost principle.

(6 marks)

(ii)   Give example of some reasonable values for the economic variables selected in (i) and explain the reason those monetary values need to be included in calculating the cost of the recreational park, and that the cost of the park is not zero, despite the donated land and equipment.

(10 marks)

QUESTION TWO (25 MARKS)

(a)   Based on the matching model in a spatial context. Workers are uniformly distributed along a highway. Each firm choses an address along the highway of a unit length and hires four workers. The cost of commuting is incorporated into the market wage: $wage = 40 + 50 \cdot d$, where d is the distance from the worker to the nearest firm.

Illustrate the determination of the wage in a city with 4 workers and 2 firms, including values for the wages in the form of a labour skills matching diagram.

(11 marks)

Continued...

(b)   Consider the location of bread-makers and sugar factories. Most bread-makers are located close to their customers and far from the required inputs (wheat and sugar), while most sugar factories are located far from customers and close to key input (sugar cane).

Illustrate the two cases (bread-makers and sugar factories) and determine the differences in terms of the monetary weights of each case's inputs and outputs using the following information for each product:

Information for Bread
- ❖ Transportation cost of wheat and sugar in total is RM3 per kilogramme
- ❖ Total weight of wheat and sugar is 600 kilogrammes
- ❖ Transportation cost of bread is RM4 per kilogramme
- ❖ Total cost weight of bread is 500 kilogrammes

Information for Sugar
- ❖ Transportation cost of sugar cane is RM5 per kilogramme
- ❖ Total weight of sugar cane is 200 kilogrammes
- ❖ Transportation cost of a box of sugar packets is RM2 per kilogramme
- ❖ Number of boxes of sugar packets is 150

(14 marks)

QUESTION THREE (25 MARKS)

(a)   Consider Oldsville, a regional economy where the smallest city with a barber (Central City) has a population of 25,000 ($N_{CC} = 25,000$) and the smallest city with an orthopaedic surgeon (Star City) has a population of 200,000 ($N_{SC} = 500,000$). Over the next 10 years, the average age of Oldsville will increase. The aging process affects the human body in two ways, hair volume decreases and the frequency of hips breaking increases.

(i) Based on the information provided above, infer the qualitative effect of aging on the population on the ratio of N_{SC}/N_{CC}.

(8 marks)

(ii) Suppose the average age doubles. The elasticity of haircuts with respect to the average age is -1.0 and the elasticity of hip replacement surgery requiring orthopaedic surgeons with respect to the average age is +1.0.

Determine the quantitative effect (i.e., in terms of numbers) of the aging of the population on the ratio of N_{OS} / N_B.

(8 marks)

Continued...

(b)   Consider a regional with two cities and a total workforce $18 = A + B$, where A is the workforce in city 1, and B is the workforce in city 2.

For the negatively sloped portion of the utility curves.
$$u(A) = \frac{480}{A}$$

$$u(B) = \frac{240}{B}$$

(i) Illustrate the regional equilibrium for both cities using utility-worker curves in a single diagram, including values for the workforces of the two cities, if the initial regional utility for each city is 40 utils.

(8 marks)

(ii) Based on your answer in (b) (i), determine which is the larger city; A or B?

(1 mark)

QUESTION FOUR (25 MARKS)

(a)   Break down the reasons that cause the Willingness to Pay (WTP) curve for office space to be negatively sloped and concave.

(6 marks)

(b)   Analyse the hedonic approach to the housing market. Determine an example of a hedonic equation of the housing market.

(7 marks)

(c)   Examine how rising income and lower commuting costs contributed to the decentralization of population over the last several decades in the United States.

(12 marks)

End of Page.